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A New Method for Detecting a Possible Parity Violating Signal in Heavy Ion Reactions at RHIC N.N. AJITANAND, Department of Chemistry, Stony Brook University, PHENIX COLLABORATION — Theoretical studies have suggested that the new phase of nuclear matter that is created in heavy-ion collisions is a good testing ground for possible violation of space and time reflection symmetry [1,2]. Recent attention has centered on the possibility that signatures for parity violation may be produced by the topological charge generated early in the process leading to QGP formation in RHIC collisions [1,2]. The strong magnetic fields developed along the orbital angular momentum (L) axis is expected to cause movement of these charges resulting in a small charge asymmetry in the angular distribution of hadrons in an event. A novel analysis method has been developed which has the required sensitivity to detect small but specific shape differences in the azimuthal angular distribution of positive and negative charges with respect to the reaction plane. Results from model simulations will be used to demonstrate the efficacy of the method, and results from application of the method to PHENIX Run-7 Au+Au data will be presented.

1.D. Kharzeev, R. D. Pisarski, and M. H. G. Tytgat, Phys. Rev. Lett. 81, 512 (1998). 2.D. Kharzeev and R. D. Pisarski, Phys. Rev. D 61, 111901 (2000).

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